

11.0 Environmental Protection Plan

11.0.01 Appendix J outlines the Protected Species and Habitats Protocols that will be used in this project.

11.0.02 The purpose of this site-specific Environmental Protection Plan is to establish the procedures to be implemented during the MEC removal action activities that will minimize impacts to the surrounding environment. EEG will coordinate all MEC clearance activities associated with this plan with the CEHNC. As established in the “Preliminary Points of Agreement between the Department of the Army and the Puerto Rico Environmental Quality Board,” EQB is the lead regulatory agency. A copy of the agreement is included in Appendix A after the SOW. **Table 11-1** provides ARARs for environmental protection as identified by USACE in coordination with EQB. **Table 11-2** provides the “to be considered” guidance documents.

Table 11-1. Applicable or Relevant and Appropriate Requirements

Activity	ARAR	Citation	Applicability or Relevance
Location-Specific			
Presence of endangered or threatened species or critical habitat of such species as designated in 50 CFR 17 or 50 CFR 226	Endangered Species Act of 1973 as amended	16 USC 1531 et seq. 50 CFR 402	On-site actions must comply with the substantive requirements of the Endangered Species Act.
Presence of essential fish habitat	Magnuson-Stevens Fishery, Conservation and Management Act	50 CFR 600.920(e)(3) 16 USC 1801	On-site actions must comply with the substantive requirements of the Magnuson-Stevens Fishery, Conservation and Management Act.
Archeologically significant site	National Historic Preservation Act	16 USC 470	On-site actions must comply with the substantive requirements of the National Historic Preservation Act.

Table 11-2. To Be Considered Guidance

Activity	Guidance	Citation	Applicability or Relevance
Worker and Public Safety	DoD Ammunition and Explosives Safety Standards	DoD 6055.9-STD	Establishes uniform safety standards applicable to ammunition and explosives, to associated personnel and property, and to unrelated personnel and property exposed to the potential damaging effects of an accident involving ammunition and explosives during development, manufacturing, testing, transportation, handling, storage, maintenance, demilitarization, and disposal.
	Ammunition and Explosives Safety Standards	DA PAM 385-64	This pamphlet provides force protection guidance for commanders with an ammunition or explosives mission. It provides procedures to protect military and civilian Army employees, the public, and the environment. It also sets forth procedures for use when transporting ammunition or explosives over the public highway. Provides guidance for the remediation of active and Formerly Used Defense Sites contaminated with ammunition and explosives.

11.0.03 Both the surface and subsurface clearance activities under this contract may require that MEC be blown in place. The following chapters of this Work Plan provide detailed procedures for the mitigation of blast effects when MEC is blown in place or removed to a consolidated shot area for detonation:

- Chapter 3, Explosives Management Plan
- Chapter 4, Explosives Siting Plan
- Appendix D, Accident Prevention Plan

11.0.04 The EEG site manager and SUXOS will be responsible for ensuring that all site work is performed in accordance with this plan and any applicable local or federal regulations.

11.0.05 Prior to the start of any on-site work, a species and habitat survey will be conducted. The result of the survey will be recorded and submitted to the appropriate regulatory agencies for information purposes. EEG will proceed in accordance with the procedures established in Appendix J.

11.1 Resources

All surface preparation and clearance activities will be conducted in a manner to minimize impacts to land resources within and outside of the project boundaries. These boundaries will be

established during the pre-clearance survey. In addition, work areas will be cleared of all non-essential personnel prior to MEC clearance activities.

11.1.1 Endangered and Threatened Species

11.1.1.01 Endangered and threatened plant and animal species inhabit specific areas of the Culebra Archipelago. It is essential that site personnel maintain close coordination with the responsible environmental resources agencies to avoid disturbing any of these species. The point of contact for endangered species coordination is the chief of the Caribbean field office of FWS, in Boqueron.

11.1.1.02 In the event that a threatened or endangered species is harmed as a result of clearance activities, EEG will notify the contracting officer.

11.1.1.03 Access to the cays will be coordinated with the responsible environmental resources agencies.

11.1.1.04 The following table lists the known endangered and threatened species that may be located in the area.

Table 11-3. Threatened and Endangered Species Potentially Occurring in Culebra Island Archipelago

Classification	English Common Name	Spanish Common Name	Latin Name	FWS ESA Status	Puerto Rico Status
Marine mammals	Sperm whale		<i>Physter catodoc</i>	E	NL
	Humpback whale	Ballena jorbada	<i>Megaptera novaeangliae</i>	NL	V
	Finback whale		<i>Balaenoptera physalis</i>	E	NL
	West Indian (Antillean) manatee	Manatí antillano	<i>Trichechus manatus manatus</i>	E	E
	Caribbean monk seal*		<i>Monachus tropicalis</i>	E	E
Birds	Brown pelican	Pelícano pardo	<i>Pelicanus occidentalis occidentalis</i>	E	E
	Peregrine falcon	Falcón peregrino	<i>Falco peregrinus tundrius</i>	NL	CE
	Roseate tern	Palometa	<i>Sterna dougalli</i>	T	V
	Masked duck	Pato dominico	<i>Oxyura dominica</i>	NL	E
	Ruddy duck	Pato chorizo	<i>Oxyura jamaicensis</i>	NL	V
	Caribbean coot	Gallinazo caribeño	<i>Fulica caribaea</i>	NL	V
	Least grebe	Tigua	<i>Tachybaptus dominicus</i>	NL	DD
	West Indian whistling duck	Chiriría antillano	<i>Dendrocygna arborea</i>	NL	CE
	White cheeked pintail	Pato quijada colorada	<i>Anas bahamensis</i>	NL	V

Classification	English Common Name	Spanish Common Name	Latin Name	FWS ESA Status	Puerto Rico Status
Birds	Least tern	Gaviota chica	<i>Sterna antillarum</i>	NL	DD
	White crowned pigeon	Paloma cabeciblanca	<i>Columba leucocephala</i>	NL	DD
	Bridled quail dove	Paloma perdiz de Martinica	<i>Geotrygon mystacea</i>	NL	DD
	Piping plover	Chorlo melódico	<i>Charadrius melodus</i>	T	CE
Reptiles	Hawksbill sea turtle	Carey de concha	<i>Eretmochelys imbricata</i>	E	E
	Leatherback sea turtle	Tinglar	<i>Dermochelys coriacea</i>	E	E
	Green sea turtle	Peje blanco	<i>Clelonia mydas</i>	T	E
	Loggerhead sea turtle	Cabezón	<i>Caretta caretta</i>	T	NL
	Virgin Islands tree boa	Boa de Islas Virgenes	<i>Epicrates monensis granti</i>	E	CE
	Puerto Rican boa	Boa puertorriqueña	<i>Epicrates inornatus</i>	E	V
	Slipperyback skink	Lucía	<i>Mabuya mabouya sloanei</i>	NL	V
	Culebra giant anole	Lagartijo gigante de Culebra	<i>Anolis roosevelti</i>	E	CE
	Puerto Rican slyder	Jicotea	<i>Trachemys stejnegeri</i>	NL	DD
Plants	Wheeler's peperomia		<i>Peperomia wheeleri</i>	E	E
	Square stem cactus		<i>Leptocereus grantianus</i>	E	NL
<p>*Caribbean monk seal is presumed extinct</p> <p>Key: CE = Critically endangered; DD = Deficient data; E = Endangered; NL = Not listed; T = Threatened; V = Vulnerable</p> <p>Sources: DNER 2004 (Regulation No. 6766); FWS 2005 (Puerto Rico species lists at URL http://ecos.fws.gov/tess_public/servlet/gov.doi.tess_public.servlets.RegionLists?lead_region=4#PR); ESEW.org 2005 (http://www.esew.org/warning_lists/usa_teritory/ puertorico/ puertorico.htm)</p>					

11.1.1.1 Benthic Habitats

11.1.1.1.01 NMFS has proposed that elkhorn (*Acropora palmata*) and staghorn (*A. cervicornis*) corals be listed as threatened under the ESA (FR Vol. 70, No. 88:24359, May 9, 2005). Staghorn coral is a branching coral with cylindrical branches ranging from a few centimeters to over two meters in length and height. It occurs in back reef and fore reef environments from 0 to 30 meters depth. The upper limit is defined by wave forces, and the lower limit is controlled by suspended sediments and light availability. Although *A. cervicornis* colonies are sometimes found interspersed among colonies of *A. palmata*, they are generally in more protected, deeper water or seaward of the *A. palmata* zone and hence protected from waves (*Acropora* BRT 2005). Fore reef zones at intermediate depths (5 to 25 meters) were formerly dominated by extensive single species stands of staghorn coral until the mid-1980s. Elkhorn coral is a large branching coral with exceptionally thick and sturdy antler-like branches forming extensive, densely aggregated thickets (stands) in areas of heavy surf. Colonies prefer exposed reef crest and fore reef

environments in depths of less than 6 meters, although isolated corals may occur to 20 meters. The preferred habitat of *A. palmata* is the seaward face of a reef (turbulent shallow water), including the reef crest, and shallow spur and groove zone (*Acropora* BRT 2005).

11.1.1.1.02 Both elkhorn and staghorn corals underwent precipitous declines in abundance in the early 1980s throughout their range, and this decline has continued. The major threats to the existence of these corals are disease, elevated temperature, and hurricanes. Disease was identified as the single largest cause of both elkhorn and staghorn coral mortality and decline. Hurricanes appear to be the main factor for the large-scale decimation of elkhorn coral (*A. palmata*) biotopes in Puerto Rican reefs (Garcia-Sais et al. 2005). Less severe stressors include anchoring and subsequent breakage of corals. Their branching morphology makes them particularly susceptible to breakage. The creation of fragments through breakage is a natural means of asexual reproduction for these species; however, the fragments must encounter suitable habitat to be able to reattach and create a new colony (FR Vol. 70, No. 88:24359, May 9, 2005).

11.1.1.1.03 Brief descriptions of some acroporid reefs in Puerto Rico were described by the *Acropora* Biological Review Team (2005) and are excerpted verbatim in the following paragraphs.

In Puerto Rico, well-developed and dense thickets of *A. cervicornis* were present through the late 1970s at many reefs surrounding the main island, and also the offshore islands of Mona, Vieques and Culebra (Almy and Carrión-Torres 1963, McKenzie and Benton 1972, Rogers 1977, Goenaga and Cintrón 1979, Boulon 1980). Later, in 1978-79 during an island-wide survey, *A. cervicornis* was found on only 20% of those reefs (Bruckner 2002). Unfortunately, quantitative trend data sufficient for a case study to depict trend in *A. cervicornis* abundance or distribution are not available from Puerto Rico. A recent description of the status of *A. cervicornis* in Puerto Rico can be found in Bruckner (2002); a few other studies are summarized below:

- Along the shelf-edge reef south of Puerto Rico, *A. cervicornis* was the dominant coral prior to Hurricane David in 1979. Twenty random 0.6 m² photoquadrats were selected from each of ten 40-m long transects parallel to the depth contours across the reef (16.7 to 19.2 m depth). Based on analysis of point count data, *A. cervicornis* had a mean of 31.1% total cover (range of 9.9 to 56.9%) prior to the storm; after the storm, total cover of *A. cervicornis* dropped to a mean of 0.90% (range of 0.02 to 2.7%) (Boulon unpubl. data).

- With the exception of a few reefs in the southwest and isolated offshore locations, the dense, high profile, monospecific thickets of both species (*A. cervicornis* and *A. palmata*) have disappeared from Puerto Rico coral reefs (Weil et al. unpublished data).
- In the summer of 2004, there was an epidemic outbreak of white pox disease at Los Corchos coral reef in Culebra, Puerto Rico. Coral cover on the reef reaches values of 80%; a total of 80 to 90% of the *A. cervicornis* colonies at a permanent monitoring site were already dead or dying three weeks after Tropical Storm Jeanne (Rogers, pers. comm.).

11.1.1.2 Birds and Reptiles

11.1.1.2.01 The cays surrounding Culebra are known nesting areas for shorebirds, seabirds, and sea turtles. Although seabirds may be present on the cays year round, the majority of shorebird and seabird nesting occurs during the spring and summer months. Critical times that MEC should not be detonated because of seabird activity are April through September; this would also be protective of most sea turtle nesting. All work schedules will be coordinated with the responsible natural resource agencies to avoid or mitigate possible disturbance of sensitive species during nesting seasons.

11.1.1.2.02 The volcanic rocks and cays of northeastern Puerto Rico provide a suitable habitat for the nesting of marine birds. These rocks and cays are unstable and subject to erosion despite their dense vegetative cover. Fourteen species of marine birds nest in the Culebra archipelago (Saliva 2005) (see following table). On the Island of Culebra and on Cayo Yerba, Saliva and Burger (1989) found that sooty terns selected nest sites that had taller vegetation and more cover over the nest and that were farther from open areas.

Table 11-4. Nesting Marine Birds of the Culebra Archipelago

Latin Name	Spanish Common Name	English Common Name
<i>Anous stolidus</i>	Cervera	Brown noddy
<i>Larus atricilla</i>	Gaviota cabecinegra	Laughing gull
<i>Phaethon aethereus</i>	Chirre de pico colorado	Red-billed tropicbird
<i>Phaethon lepturus</i>	Chirre de cola blanca	White-tailed tropicbird
<i>Puffinus lherminieri</i>	Pampero	Audobon's shearwater
<i>Sterna anaethetus</i>	Gaviota monja	Bridled tern
<i>Sterna dougalli</i>	Palometa	Roseate tern
<i>Sterna eurygnatha</i>	Gaviota de cayena	Cayenne tern

Latin Name	Spanish Common Name	English Common Name
<i>Sterna fuscata</i>	Gaviota oscura	Sooty tern
<i>Sterna maxima</i>	Gaviota real	Royal tern
<i>Sterna sandvicensis</i>	Gaviota piquiaguda	Sandwich tern
<i>Sula dactylatra</i>	Boba enmascarada	Masked booby
<i>Sula leucogaster</i>	Boba parda	Brown booby
<i>Sula sula</i>	Boba patirroja	Red-footed booby
Source: Saliva 2005		

11.1.1.2.03 Roseate tern (palometa), a threatened species, arrives at the end of April and begins nesting in the middle of May. Nesting areas may be moved from year to year. If reproduction is successful, juveniles and adults leave Culebra at the end of July or early August. Nesting pairs of roseate tern have continually declined from 300 in 1988 to 15 to 25 in the 1990s. Population estimates in 2000 and 2004 indicated no more than 15 pairs (Saliva 2005). Roseate terns usually hide their nests under some sort of protective cover such as rocks, vegetation, or washed-up debris (Spendelow 1995). Caribbean birds use a variety of substrates, including open sand and coral rubble, rocky cliffs, and low islands. Nesting sites may be densely vegetated or bare. Varying amounts of debris and vegetation may be present in the nesting area.

11.1.1.2.04 The Atlantic Coast piping plover (*Charadrius melodus*) population breeds on coastal beaches from Newfoundland to North Carolina (and occasionally in South Carolina). The piping plover's winter range extends along the Atlantic and Gulf coasts from North Carolina to Mexico and into the Bahamas and West Indies (FWS 1996). Plovers appear to prefer sandflats adjacent to inlets or passes, sandy mudflats along prograding spits, and overwash areas as foraging habitats (FWS 1996, 50 CFR 17).

11.1.1.2.05 NMFS (FR Vol. 63, No.170, September 2, 1997) designated critical habitat pursuant to the Endangered Species Act of 1973 (ESA) for the threatened green turtle (*Chelonia mydas*) to include waters extending seaward 3 nautical miles (5.6 kilometers) from the mean high water line of Culebra Island. These waters include Culebra's outlying cays, including Cayo Norte, Cayo Ballena, Cayos Geniqui, Isla Culebrita, Arrecife Culebrita, Cayo de Luis Pena, Las Hermanas, El Mono, Cayo Lobo, Cayo Lobito, Cayo Botijuela, Alcarraza, Los Gemelos, and Piedra Steven. The extensive seagrass beds of the Culebra archipelago support a large juvenile population of green turtles.

11.1.1.2.06 On November 10, 1993, FWS designated Culebra seagrass beds as Resource Category 1, recognizing these seagrasses as critical foraging habitat for juvenile green turtles. Resource Category 1 designation recognizes the habitat as unique and irreplaceable on a national or ecoregional level and states that loss of the habitat is not acceptable. The seagrass beds of Culebra consist primarily of turtle grass (*Thalassia testudinum*). In the Caribbean, turtle grass beds consist primarily of turtle grass but may include other species of seagrass such as manatee grass (*Syringodium filiforme*), shoal grass (*Halodule wrightii*), and sea vine (*Halophila decipiens*), as well as several species of algae including green algae of the genera *Halimeda*, *Caulerpa*, and *Udotea*.

11.1.1.2.07 Nesting hawksbill sea turtles prefer low-energy sandy beaches with woody vegetation such as sea grape or saltshrub located within a few meters of the water line. Suitable nesting habitat can be extremely variable and ranges from high-energy ocean beaches to tiny pocket beaches only a few meters in width. Nests are typically placed under vegetation (NMFS/FWS 1993). The nesting season varies with locality, but in most locations nesting occurs some time between April and November. Hawksbills nest at night and, on average, about 4.5 times per season at intervals of approximately 14 days. On Isla Culebrita, all beachfront areas on the southwest-facing shore, east-facing shore, and northwest-facing shore of the island from mean high tide inland to a point 150 meters from shore have been designated critical habitat for hawksbill sea turtles (50 CFR 17.95).

11.1.1.2.08 The largest concentration of nesting leatherback sea turtles in the United States Caribbean has been documented at Sandy Point National Wildlife Refuge, St. Croix, and Playa Brava and Playa Resaca on Culebra Island. Nesting females prefer high-energy beaches with deep and unobstructed access. The Island of Culebra and St. Croix beaches have the greatest density of leatherback nests within United States waters. In the wider Caribbean, major nesting commences in March (a few nests may be laid from December to February) and continues into July (NMFS/FWS 1992). On Culebra, the nesting season begins in February and continues through July. Hatching may begin as early as April and continues through September. Leatherbacks nest in sand near the vegetation line on the beach (<http://www.coralations.org/turtles/index.htm>). Atlantic leatherbacks nest an average of six times from March to July, with approximately 10 days between the nesting episodes. Often turtles will lay their nests in areas that are under water during high tide.

11.1.1.2.09 In the Atlantic, leatherbacks nest from November to April

(http://www.speciesatrisk.gc.ca/search/speciesDetails_e.cfm?SpeciesID=274). In St. Croix, the nesting period extends from February 9 to August 11, with each turtle laying an average of 5.26 nests per season with an inter-nesting interval of 9.6 days (Boulon et al. 1996).

11.1.1.2.010 On Culebra and the surrounding cays, the slipperyback skink (*Mabuya mabouya*) is listed as vulnerable in DNER Regulation No. 6766 and in the Draft Puerto Rico's Comprehensive Wildlife Conservation Strategy. This skink is found in dry tropical forests in leaves, rocks, and trunks. Slipperyback skink was restricted to dry scrub woodland and littoral forest in the Dominican Republic (citation Ricklefs and Lovette 1999).

11.1.2 Water Resources

11.1.2.01 The work sites are located in areas where water features such as lakes and ponds are intermittent and contain water only during extreme rain events. Lakes and ponds, even though they exist in some Culebra Island locations, are not located in the proposed work sites. A small cattle watering pond is in the Cerro Balcon area. Drainage features only intermittently contain water. No streams are located on Culebra.

11.1.2.02 Lagoons are located on the northwest portion of Isla Culebrita within the strafing range project area. Saline ponds and lagoons are particularly important to migratory waterfowl such as blue-winged teal, as well as the resident white-cheeked pintail and several waders. The usual fringe of mangroves surrounding these saltwater ponds provides habitat for nesting populations of herons, pigeons, and many songbirds (<http://biology.usgs.gov/s+t/SNT/noframe/cr133.htm>).

11.1.2.03 Groundwater is not commonly encountered on Culebra Island or the surrounding cays due to the limited thickness of soil and the shallow igneous rock; therefore, groundwater resources will not be adversely affected by site operations.

11.1.3 Wetlands

The proposed work will not be conducted in submerged wetlands areas. The wetlands areas will be identified during a survey. EEG personnel will perform required tasks in a manner that will minimize the possibility of surface runoff that may affect the wetlands. EEG field supervisors will monitor work sites for situations that could cause wetlands impact and will alert the appropriate agency.

11.1.4 Cultural and Archaeological Resources

11.1.4.01 The archeological survey will be conducted concurrently with the species and habitat survey by an archeologist meeting the Department of the Interior's Professional Qualification Standards for Archeology

11.1.4.02 During operations, personnel will visually inspect the site for cultural and archaeological artifacts. Care will be taken during clearance activities to avoid disturbance of cultural artifacts. Any items found will be marked, and the CEHNC project manager will be notified of the finding. Work in the immediate area of an artifact will be halted until a qualified person properly inspects the item. The government retains ownership and control over historical and archaeological resources.

11.1.4.03 EEG employees will be informed that they are not permitted to remove cultural artifacts from the site and will be subject to disciplinary action if they fail to comply with this requirement. They will also be informed that they must notify the EEG project manager immediately upon finding non-MEC-related manmade items on the site. The item(s) will be left where it was found unless it might be impacted by detonation of MEC. EEG personnel will obtain the GPS coordinates of the item, photograph the item, and notify the EEG project manager immediately of the potential find. The EEG project manager will notify the CEHNC and CESAJ project managers and submit the findings data to them by e-mail for quick notification to the State Historic Preservation Officer.

11.1.5 Coastal Zones

11.1.5.01 The MEC removal sites are located in the upland areas in Cerro Balcon; however, the removal action will also include beaches in and around Isla Culebrita and the other cays included in the SOW. Operations on Isla Culebrita and other cays will require transport of work crews and equipment via boat. All landing and transport areas will be coordinated with the responsible natural resource agencies.

11.1.5.02 A benthic survey will be conducted for the purposes of locating appropriate anchoring and access locations for the cays. The results of the survey will be documented and provided to the appropriate regulatory agencies. The survey will be used by EEG to determine best access routes to the cays and anchorage locations which will minimize impacts to the environment.

11.1.5.03 Twelve benthic habitat types were identified in the Luis Peña Canal Natural Reserve (Hernández-Delgado 2003). These included linear reef, colonized bedrock, colonized pavement, scattered coral rock, colonized pavement with channels, patch reef, seagrass (four categories based on percent cover), macroalgae plains, and sand.

11.1.5.04 The additional smaller cays are generally surrounded by coral habitat (see benthic habitat maps in Appendix I). Garcia-Sais et al. (2001) provided a description of reefs of the Cordillera de Fajardo Natural Reserve that lies between Culebra and Fajardo, Puerto Rico. “Rock reefs” are the most abundant and prominent formation within reserve boundaries. These are mostly found on the windward side of islets and thereby exposed to very high wave action, particularly during the winter. Biological assemblages are generally limited to encrusting biota (including corals), with low vertical relief and providing only a minor contribution to the physical structure of the reef. “Patch reefs” are generally small, submerged reef structures surrounded by a sandy substrate, sometimes consisting of only one large coral colony. Patch reefs are common along the leeward side of the larger islets. Coral reefs are best developed as “fringing reefs” on the leeward (protected) section of the chain of islets at the northern boundary of the reserve. Turf algae habitat generally dominates percent cover estimates of the benthic habitat (Garcia-Sais et al. 2005, 2001).

11.1.5.05 The work crew landing and staging area on Isla Culebrita would likely be the dock area located on the southwestern side of the island. A secondary area would be the mooring buoy in the Bahia Tortuga; however, this would require crews to wade to the beach. Work on Culebrita is expected to take approximately 127 days. Work schedules will be coordinated with the responsible environmental resources agencies to avoid bird and sea turtle nesting seasons, and to avoid damage to benthic habitats.

11.1.5.06 Landing, anchoring, and staging areas for the additional cays will be determined in conjunction with regulatory agencies before work starts on those cays. The smaller cays are largely inaccessible except during the calmest seas, and landing areas may necessarily vary depending on wind and wave direction. Out of necessity, landing areas would generally be on the leeward side of the cays, the side that generally has the best developed reefs. Work on the cays is anticipated to take approximately 72 days and will begin in October 2006. The following table provides the estimated number of days required to complete surface clearance operations on each of the cays and Isla Culebrita.

Site Name	Estimated Acres	Estimated Clearance Days
Isla Culebrita	82	127
Cayo Botella	3	12
Cayo Tiburon	1	3
Los Gemelos	2	5
Cayo del Agua	2	5
Cayos Geniqui	4	7
Cayo Alcarraza	7	10
Cayo Lobo	20.5	30

11.1.5.07 To reduce fragmentation distance and potential for fire, detonations of munitions up to 155 mm will be tamped with biodegradable sandbags or water bags. If MEC is deemed acceptable to be moved, it will be moved toward the site interior at a distance greater than 200 feet from the shoreline for detonation. If MEC is deemed unacceptable to be moved and occurs less than 200 feet from the shoreline, it is possible that sandbag remnants could be blown into the water. Sandbag remnants landing in the water would cause minimal adverse impacts and would not reduce the quality or quantity of essential fish habitat, would cause no cumulative impacts, and would not adversely effect populations of species listed in Caribbean Fishery Management Council management plans.

11.1.5.08 Water containment may be used rather than sandbags. Water to fill the containment system would be pumped from nearshore environment. Water would be obtained from the site's adjacent waters utilizing a centrifugal trash pump. These pumps typically have pumping rates of 200 to 400 gallons per minute with a 2-inch to 4-inch intake port. Water containment could require up to 1,100 gallons of water. Small invertebrates, zooplankton, ichthyoplankton, and juvenile or small fish could potentially be entrained in the intake water. Given the small volumes of water needed (approximately 1,000 gallons) and the short duration of pumping (approximately five to ten minutes) the wetting operations would produce a minimal adverse and short-term impact. To further reduce the entrainment potential of juvenile and small fish, the end of the intake hose may be covered with a screen. The potential minimal and short-term entrainment of organisms would not reduce the quality or quantity of essential fish habitat and would not adversely affect populations of managed species.

11.1.5.09 The worst-case scenario would involve the detonation of 500-to-1,000-pound bombs, if those are discovered. Those larger ordnance items cannot be tamped with sandbags or water.

The detonation of those items would produce fragments that will be blown into the water. The maximum fragment weights for the 500- and 1,000-pound bombs are 0.89 and 0.9 pound, respectively. Maximum fragmentation distances are 3,177 feet for the 500-pound bomb and 3,288 feet for the 1,000-pound bomb. The ranges for no more than one hazardous fragment per 600 square feet are 688 feet for the 500-pound bomb and 813 feet for the 1,000-pound bomb (see MSD calculation sheets in Appendix G). The descent of fragments will be slowed by the water as they settle to the bottom.

11.1.6 Tree and Shrub Removal

11.1.6.01 It is the intent, wherever possible, to prune and trim vegetation instead of removing it. EEG personnel will conduct a pre-removal site survey to document the existing trees and shrubs and identify the extent of the work areas. With the exception of Wheeler's peperomia on Cayo Botella, no known endangered or threatened plants or shrubs have been observed in the work areas, but any desirable flora will be identified and marked by EEG. EEG will revise the removal areas to not include the sensitive areas identified in the species and habitat survey.

11.1.6.02 Brush, undergrowth, and small trees (less than 2 inches in diameter) will be cut and/or removed only to a point that is necessary for surface clearance activities. All trees greater than 2 inches in diameter and not requiring removal will be protected. At Cerro Balcon, trees and shrubs greater than 2 inches in diameter may be required to be removed. Their removal will be coordinated with DNER. Tree removal on the cays and Culebrita is not anticipated. Areas disturbed due to demolition of MEC will be restored to natural grade where possible.

11.1.7 Waste Disposal Sites

11.1.7.01 Solid waste at this site refers to all garbage, refuse, debris or other discharged material (except for hazardous waste or debris and sanitary waste). All solid waste derived during the clearance operations will be collected on a daily basis. As the amount of solid waste derived from this operation will be minimal, it will be collected in plastic bags for disposal at the local landfill located to the south of the Northwest Peninsula. All recyclable debris (metals, etc.) will be taken to appropriate disposal facilities. Cleared brush, trees, and vegetation will be moved off of the work site and contained in organized piles just outside of the work areas.

11.1.7.02 Temporary sanitary facilities will be used for sanitary disposal. Waste derived from these units will be taken to sanitary facilities for disposal.

11.2 Mitigation Procedures

EEG will coordinate all site activities with the appropriate local, territory, and federal regulatory agencies to ensure proper protection of the environment. The following subchapters describe the procedures that will be followed.

11.2.1 Manifesting, Transporting, and Disposing of Wastes

Waste, with the exception of sanitary waste and vegetation debris from clearing operations, will be removed from the site on a daily basis by contractor personnel.

11.2.2 Burning Activities

EEG does not anticipate the use of burning to mitigate any waste at the site.

11.2.3 Dust and Emissions Control

EEG personnel will make concerted efforts to limit the amount of ground disturbance and related dust emissions during the surface clearance operations. Vegetation will be cut to reasonable levels to allow surface clearance operations, but vegetative cover will be maintained as much as possible in order to hold soil in place. The only excavation anticipated is for potentially partially buried MEC, but the average excavation area for ordnance removal would be approximately 2 feet by 2 feet. Very little dust should be generated during this process.

11.2.4 Spill Control and Prevention

11.2.4.01 Due to the nature of site activities, the potential for a spill of hazardous materials is minimal and is limited to potential spillage of small quantities of fuels, radiator fluid, or hydraulic oils. EEG shall take all necessary precautions to prevent spills and provide contingency measures for the cleanup of potential spills during the performance of this project. To minimize the potential for spillage and the impact of spilled materials, EEG shall:

- Store and use minimal quantities of fuels and/or oils
- Utilize work practice controls to prevent spills during refueling and maintenance operations that involve power tools, site vehicles, and equipment (this will include the use of spill pans to collect spilled materials)
- Provide all spill response supplies and equipment necessary to contain spilled materials and to remove and contain materials that become contaminated due to spillage. A spill

containment kit will include absorbent material, a shovel, and a storage container will be available in the vehicle assigned to the UXOQC/SO.

- Develop and implement decontamination procedures that may be necessary for the removal and clean-up of spilled materials

11.2.4.02 Fuel and/or oil spills will be contained using an absorbent material to prevent the spill from spreading over a large area. The absorbent will be allowed enough time to absorb all free products, and then it will immediately be removed to a sealable container. Any soil that may be affected by the spill will be excavated and placed in the same closable container.

11.2.5 Storage Areas and Temporary Facilities

11.2.5.01 Storage areas at the Culebra site will contain fuel, munitions debris, cultural debris, and explosives. These items will not be stored on the cays and on Culebrita.

11.2.5.02 Fuel will be brought in each day in 5-gallon containers to fuel the vehicles and equipment as needed. If fuel storage is required, an area will be set up with proper notification to identify it as a non-smoking area. Additionally, the fuel storage area will include spill containment using a plastic liner or tub underneath each fuel can.

11.2.5.03 Munitions debris and cultural debris will be stored in the proximity of the explosives magazine compound. The magazine compound will be fenced in a manner to inhibit personnel from entering the area. EEG will keep the waste in segregated piles or sealed drums prior to transport from the site.

11.2.5.04 All explosives will be stored in one locked explosives magazine located in a fenced magazine compound in accordance with the procedures detailed in Chapter 4.

11.2.6 Access Routes

11.2.6.01 Care will be taken to ensure that the public does not enter work areas. Barricades will be set up at appropriate distances from the work areas so that all public withdrawal and minimum separation distances are attained. Personnel will man the barricades and patrol the site perimeter prior to demolition operations.

11.2.6.02 All landing and transport areas on cays will be coordinated with the responsible natural resource agencies.

11.2.7 Trees and Shrubs Protection and Restoration

Protection and restoration of trees and shrubs will be accomplished in accordance with Appendix J.

11.2.8 Control of Water Run-on and Run-off

11.2.8.01 Contamination to soils as a result of activities performed during this removal action is not expected; however, when appropriate, all reasonable precautions will be taken to prevent run-on from entering areas of the site. Such precautions may include construction of temporary dikes using off-site materials, use of sandbags, or other actions.

11.2.8.02 All project activities will be conducted in a manner to prevent the discharge of pollutants into adjacent waterways. All toilet facilities will be of the portable chemical type, and disposal of wastes will be to an off-site facility. If any areas are adjacent to wetlands or other bodies of water, sandbags or other barrier devices will be used to reduce the spread of potentially contaminated soil or water.

11.2.9 Equipment Decontamination and Disposal

Equipment contamination is not expected at this site; therefore, decontamination will not be conducted. Soil sampling equipment will be dedicated and pre-cleaned to eliminate the need for decontamination.

11.2.10 Minimization of Disturbed Areas

Areas disturbed during surface clearance operations will be kept to the minimum necessary to accomplish the mission. No disturbance will occur outside the approved work area boundaries.

11.2.11 Procedures for Post-Activity Cleanup

Upon project completion and subject to instructions by the contracting officer, EEG will remove all temporary facilities, stockpiles of excess material, and any other signs of activity. Disturbed areas will be restored to their prior condition.

11.2.12 Air Monitoring Plan

As these sites are remote, air quality monitoring will not be required.

11.2.13 Compensatory Measures

Significant impacts to the essential fish habitats are not anticipated during this field effort. In the case inadvertent and unavoidable impacts to the essential fish habitat occur, EEG will document the damage and notify the contracting officer's representative and the responsible environmental resources agencies. The extent and type of damage as well as the cause will be detailed. The overall impact of the damage will be determined and the contracting officer will assess compensatory measures.